

A semi-automated method and apparatus is described for applying stains to test fabrics for use in the testing of detergent compositions and laundry methods. Fabric swatches (20) covered by a template (22) defining a 4 by 4 matrix travel on pallets (18) by means of a closed loop conveyor track (10) to a dispensing area, where there are four dispensing stations (32a, 32b, 32c, and 32d). Each station has four pots (40), each containing a stain material which is held under pressure by means of a compressed air supply (48). Stain material is passed from the pot (40) by a motorised valve (42) to a respective nozzle (34), under the control of a valve (44). At the same time, compressed air is supplied to the nozzle (34) under the control of the valve (44) to cause the stain material to be atomised, and projected towards the template (22) on the swatch (20).

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1 Method and Apparatus for Applying Stains to Fabrics

2

3 This invention relates to a method and apparatus for
4 applying stains to fabrics.

5

6 One application of the present invention is in
7 producing test fabrics for use in the testing of
8 detergent compositions and laundry methods.

9

10 It is known to make use of test fabrics in the form of
11 swatches each of which carries a number of stains
12 produced by different soiling materials. These
13 swatches are conventionally produced by means of
14 applying the selected stains to a given swatch by hand,
15 but it is difficult using manual application to produce
16 consistent results.

17

18 It is also known to apply the stains by a mechanised
19 method which does provide better consistency. However,
20 the known mechanised method relies on the use of
21 additives to apply the stains, and the use of additives
22 adversely affects the test results.

23

24 According to one aspect of the present invention a
25 method of applying staining to a test fabric comprises

1 providing at least one reservoir containing a selected
2 stain material in the form of a liquid, emulsion or
3 fluid paste, and spraying the stain material onto a
4 test fabric swatch from a nozzle by means of a
5 pressurised gas which atomizes the stain material and
6 projects it from the nozzle.

7

8 The pressurised gas may conveniently be compressed air.

9

10 Preferably, a plurality of stain materials are sprayed
11 from a plurality of nozzles onto the swatch.

12

13 In a particularly preferred form of the invention,
14 swatches are passed serially through a stain dispensing
15 area, each swatch being covered by a template which
16 defines a plurality of sample locations on the swatch.
17 The template may for example define a matrix of 4 x 4
18 sample locations, with a row of four stain materials
19 being sprayed in each of four spray stations.

20

21 From another aspect, the present invention provides
22 apparatus for applying stains to a test fabric, the
23 apparatus comprising at least one reservoir for
24 containing a selected stain material in the form of a
25 liquid, emulsion or flowable paste, location means for
26 positioning a test fabric swatch, a nozzle positioned
27 to spray the stain material on to a test fabric swatch
28 in said location means, and means for supplying
29 pressurised gas to the nozzle so as to atomize the
30 stain material and project it from the nozzle.

31

32 The means for supplying pressurized gas may
33 conveniently comprise a compressed air line.

34

35 A particular form of the invention comprises a conveyer
36 track passing from a loading area through a stain

1 dispensing area to an unloading area. The track is
2 adapted to transport a series of pallets each of which
3 carries a test fabric swatch overlaid by a template,
4 the template defining a matrix of sample locations on
5 the swatch, and the dispensing area having a plurality
6 of spraying stations each of which comprises a
7 plurality of said nozzles.

8
9 An embodiment of the present invention will now be
10 described by way of example, with reference to the
11 drawings, in which:-

12
13 Fig. 1 is a schematic plan view of one form of
14 apparatus in accordance with the present
15 invention.

16 Fig 2. is a schematic end view of part of the
17 apparatus taken in the direction of the arrows 2-2
18 in Fig. 1.

19 Fig. 3 is a block diagram of part of the apparatus
20 of Fig. 1.

21
22 The apparatus comprises a closed loop conveyer track 10
23 which passes from a loading area 12 through a
24 dispensing area 14 to an unloading area 16. The track
25 12 carries a series of pallets 18. At the loading area
26 12 an operator covers each of the pallets 18 with a
27 textile fabric swatch 20 which in turn is covered with
28 a template 22 defining a 4 x 4 matrix of apertures 24.
29 When ready, the pallets 18 is released from the loading
30 area 12 by the operator depressing a foot switch 26 to
31 release a pallet stop 28.

32
33 A further pallet stop 30 synchronises movements of the
34 pallets 18 into the dispensing area 14.

35
36 The dispensing area 14, which may conveniently be

1 enclosed in transparent sheet material (not shown),
2 provides four dispensing stations 32a, 32b, 32c and
3 32d. In each of the dispensing stations 32 a row of
4 four nozzles 34 dispenses sprays of stain material
5 towards one row of template apertures 24. After all
6 sixteen template locations have received sprayed
7 material, the pallets pass on the conveyor 10 to the
8 unloading area 16 where another operator removes the
9 textile swatches 20, wipes any residue from the surface
10 of the template 22, and releases the pallets 18 for re-
11 use by means of a pallet stop 36 activated by a foot
12 switch 38.

13
14 Referring more particularly to Figs. 2 and 3, each of
15 the stain materials is held in a respective pot 40
16 under pressure, for example from a compressed air
17 supply 48. At the appropriate point in the cycle stain
18 material is passed from the pot 40 by a motorised valve
19 42 to the respective nozzle 34, and at the same time
20 compressed air is supplied to the nozzle 34 under the
21 control of a valve 44 to cause the stain material to be
22 atomized and projected towards the swatch 20.
23 Atomizing nozzles of this general type are known in the
24 art.

25
26 It will be appreciated that this arrangement requires
27 the stain material to be in a liquid or semi-liquid
28 form. For example, if it is desired to produce a clay-
29 based staining, then it will be necessary to disperse
30 clay particles in water or another suitable liquid
31 carrier.

32
33 Certain stain materials require to be heated to give
34 good flow characteristics and accordingly heating means
35 (not shown) may be incorporated in the system, which
36 may conveniently be in the form of electric trace-

1 heating tapes.

2
3 Other stain materials may be liable to settling out and
4 accordingly selected storage pots may be provided with
5 means to prevent this, such as a motor driven paddle,
6 or a re-circulating pump as indicated at 46 in Fig. 3.

7
8 The operation of the system may suitably be controlled
9 by a programmable logic controller (not shown) arranged
10 to maintain the dispensing procedure in synchronism.
11 The programmable logic controller may also conveniently
12 monitor other factors such as low stain material levels
13 and process temperatures, and generate warning or alarm
14 signals accordingly.

15
16 Modifications may be made to the foregoing embodiment
17 within the scope of the present invention.
18
19

CLAIMS

- 1 1 A method of applying staining to a test fabric
2 comprising providing at least one reservoir
3 containing a selected stain material in the form
4 of a liquid, emulsion or fluid paste, and spraying
5 the stain material onto a test fabric swatch from
6 a nozzle by means of a pressurised gas, which
7 atomises the stain material and projects it from
8 the nozzle.
- 9 2 A method according to claim 1, in which the gas is
10 compressed air.
- 11 3 A method according to claim 1 or claim 2, in which
12 a plurality of stain materials are sprayed from a
13 plurality of nozzles onto the swatch.
- 14 4 A method according to claim 3, in which plurality
15 swatches are passed serially through a stain
16 dispensing area, each swatch covered by a
17 template.
- 18 5 A method according to claim 4, in which the
19 template defines a 4 by 4 matrix of sample
20 locations, with a row of four stain materials
21 being sprayed in each of four spray stations.
- 22 6 Apparatus for applying stains to a test fabric,
23 comprising at least one reservoir for containing a
24 selected stain material in the form of liquid,
25 semi liquid or flowable paste, location means for
26 positioning a test fabric swatch, a nozzle
27 positioned to spray the stain material on to a
28 test fabric swatch in the location means, and
29 means for supplying pressurised gas to the nozzle

1 so as to atomize the stain material and project it
2 from the nozzle.

3

4 7 Apparatus according to claim 6 in which the means
5 for supplying pressurised gas comprises of
6 compressed air line.

7

8 8 Apparatus according to claim 6 or claim 7,
9 including a plurality of nozzles positioned to
10 spray a plurality of stain materials onto each
11 swatch.

12

13 9 Apparatus according to claim 8, in which each
14 swatch is mounted a pallet and covered by a
15 template.

16

17 10 Apparatus according to claim 9, including a
18 mechanism for transporting the pallets containing
19 the swatches and templates in the form of a closed
20 loop conveyor track passing from a loading area
21 through a stain dispensing area to an unloading
22 area.

23

24 11 Apparatus according to claim 10, in which
25 synchronisation of the flow of pallets along the
26 closed loop conveyor is by means of three pallet
27 stops, one at the loading area, one before the
28 dispensing area, and one at the unloading area.

29

30 12 Apparatus according to any of claims 6 to 11,
31 including means for maintaining the stain
32 material(s) in flowable form.

33

34 13 Apparatus according to claim 12, in which said
35 means comprises electric trace heating tapes
36 and/or a motor driven paddle.

1 / 2

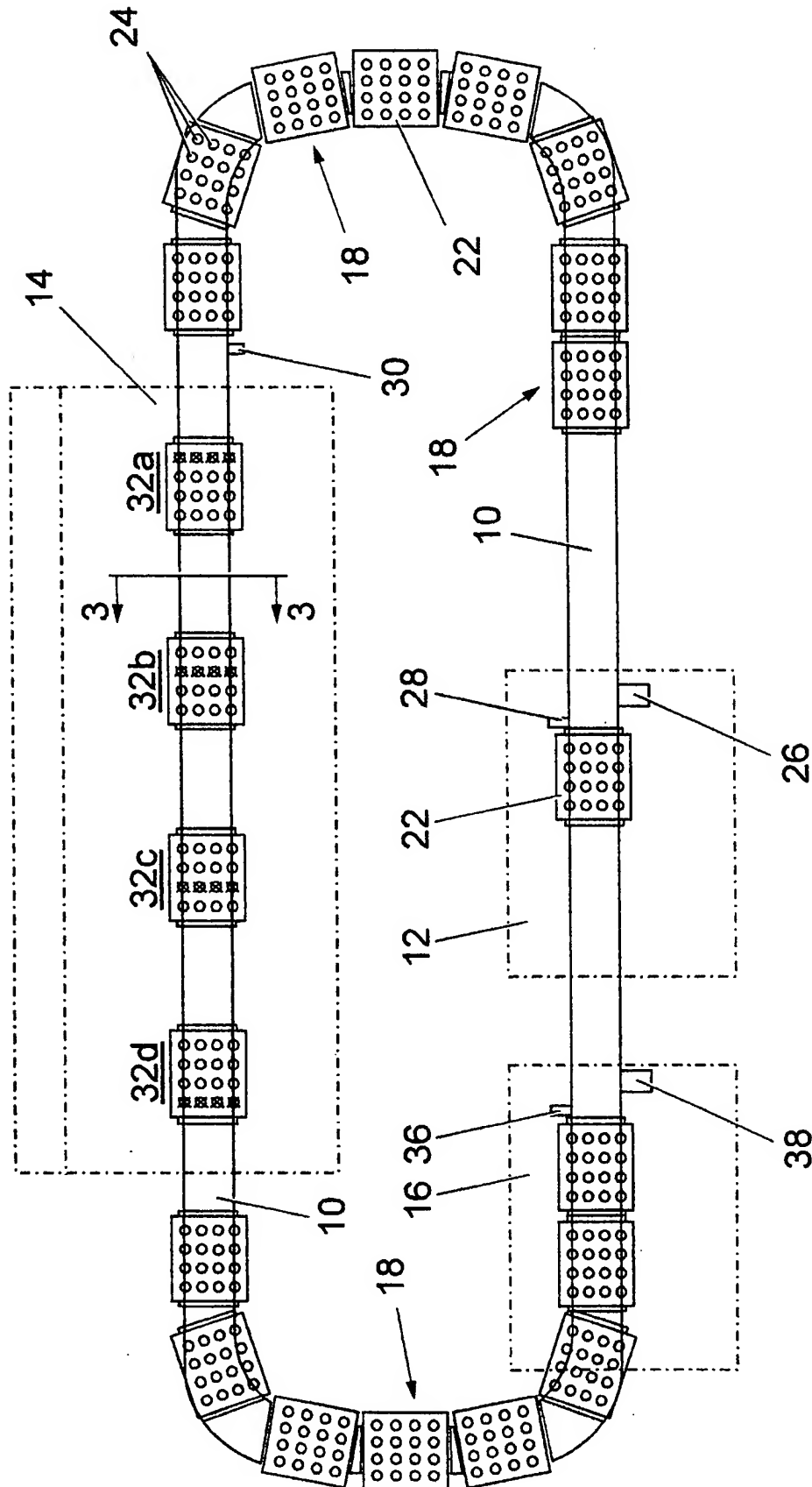


Fig. 1

2 / 2

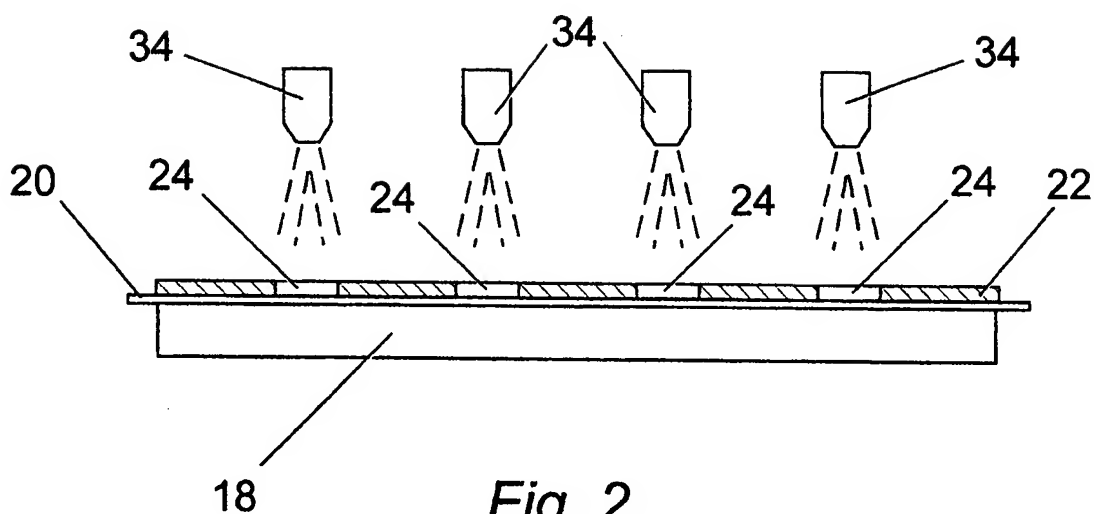


Fig. 2

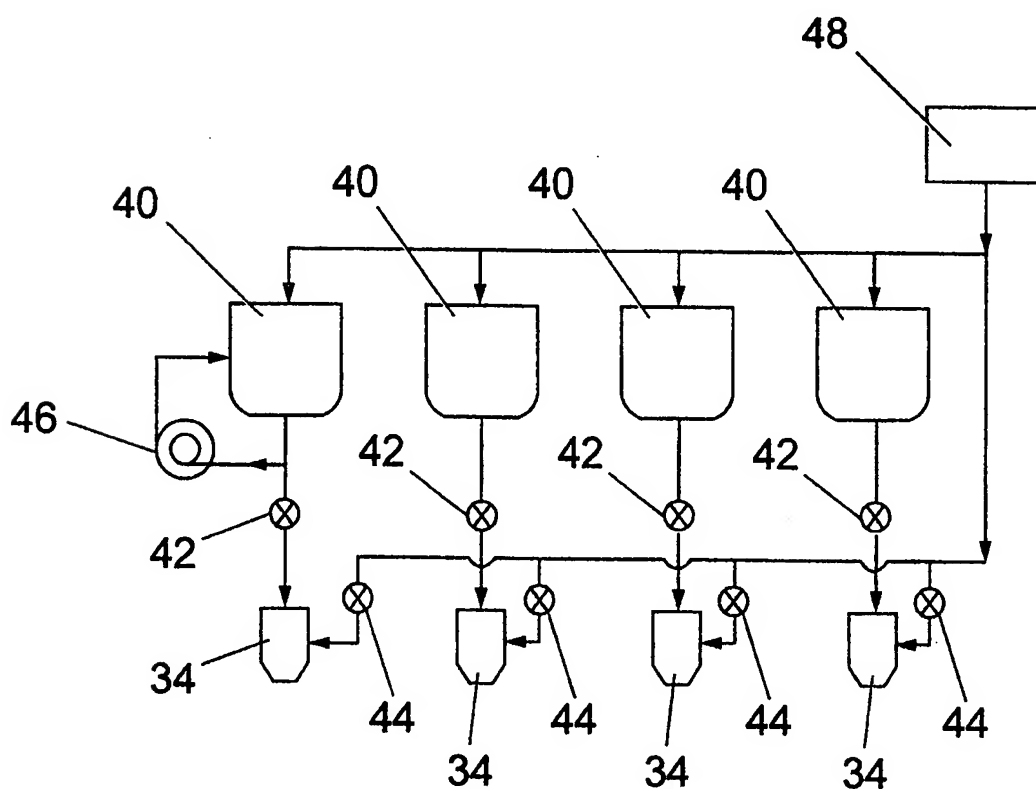


Fig. 3

INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB 98/00041

A. CLASSIFICATION OF SUBJECT MATTER

IPC 6 G01N33/36 C11D17/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 G01N C11D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	WO 91 10005 A (WOOL DEVELOPMENT INTERNATIONAL LTD) 11 July 1991 see page 4, paragraph 2 - page 13, paragraph 1; figures 1-4 ----	1-3, 6-8, 12
Y	US 4 529 880 A (MERRILL ET AL.) 16 July 1985 see the whole document ----	1-3, 6-8, 12
A	DD 88 508 A (H.J. JACOBASCH ET AL.) 12 March 1972 see the whole document ----	1, 6
A	US 4 760 961 A (NAGAI) 2 August 1988 see the whole document -----	1, 6



Further documents are listed in the continuation of box C.



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information on patent family members

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9110005 A	11-07-1991	NONE	
US 4529880 A	16-07-1985	GB 2138133 A	17-10-1984
DD 88508 A		NONE	
US 4760961 A	02-08-1988	NONE	